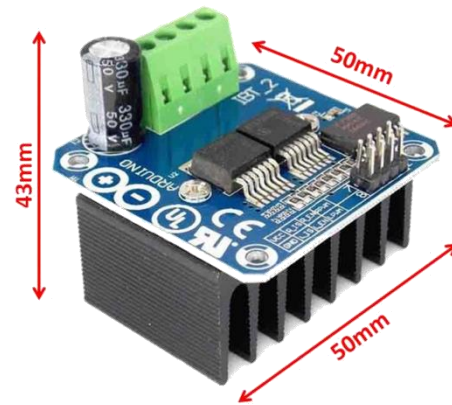


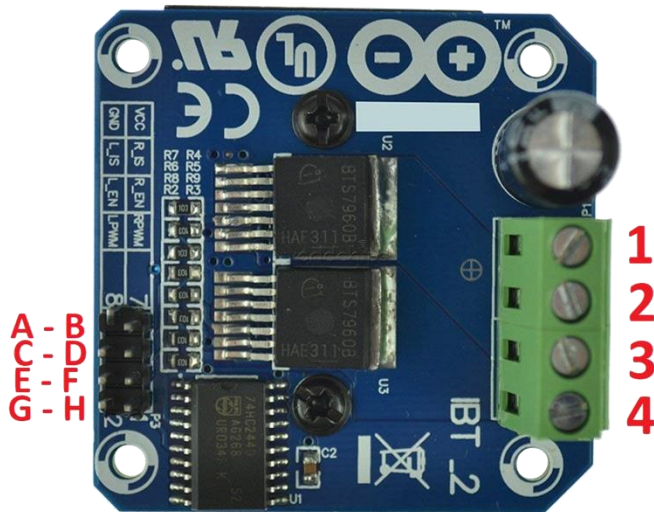
BTS7960 DC Motor Driver

Specs

- Input Voltage: 6-27V
- Drive Voltage: 6-27V
- Driver Current: 43A MAX Continuous
- Max Power: 3100 Watts
- Logic Input Voltage (VCC): 5V
- Logic Voltage: 2-5V On/High, <2V Off/Low



The BTS7960 motor driver will control one motor. It requires a power supply (6-27V DC), a +5V logic power supply, and one to two +5V PWM inputs to control rotational speed and direction. The BTS7960 will operate in three different methods of wiring. The first method is described under Fixed Speed Operation and will allow the motor to operate full speed forward or reverse. Alternately, Methods 2 and 3 are described under Variable Speed Control and allow for motor speed control.



- A (GND):** ground
- B (VCC):** controller power supply (5V)
- C (L IS):** reverse/current alarm output
- D (R IS):** forward/current alarm output
- E (L EN):** reverse/enable (active HIGH)
- F (R EN):** forward/enable (active HIGH)
- G (LPWM):** reverse/PWM (active HIGH)
- H (RPWM):** forward/PWM (active HIGH)
- 1 (B-):** motor power supply-
- 2 (B+):** motor power supply+ (5.5-27V)
- 3 (M+):** motor+
- 4 (M-):** motor-

Fixed Speed Operation

- Connect terminal 1 to Ground and terminal 2 to Positive of a 6-27 V power supply
- Connect terminals 3 and 4 to motor positive and negative, respectively
- Connect logic pin A to ground and pins B, E and F to a +5V power supply
- For forward rotation, connect pin H to +5V power supply. For reverse rotation, connect pin G to +5V power supply. This will operate the motor at full speed either forward or reverse

Control method 1 (Full speed, forward or reverse)

PIN H	PIN G	PINS E + F	Motor Output
5 volts	0 volts	5 volts	Full speed Forward
0 volts	5 volts	5 volts	Full speed Reverse

Variable Speed Operation

To control motor speed, you must use a PWM signal. Speed is proportional to % Duty Cycle. You cannot use analog voltage to control speed.

- Connect terminal 1 to Ground and terminal 2 to Positive of a 6-27 V power supply
- Connect terminals 3 and 4 to motor positive and negative, respectively
- Connect logic pin A to ground and pin B +5V power supply
- Connect remaining pins as shown in tables below

Control method 2 (Speed proportional to PWM on PIN H/PIN G. Better for slower speeds but requires two PWM signals, one for Forward and the other for Reverse)

PIN H	PIN G	PINS E + F	Motor Output
PWM (500 Hz, 5V amplitude)	0 volts	5 volts	Variable speed Forward
0 volts	PWM (500 Hz, 5V amplitude)	5 volts	Variable speed Reverse

*At 12V input, motor operates between roughly 15% to 100% duty cycle, 30% to 100% duty cycle under significant load

Control method 3 (Speed proportional to PWM on PINS E + F. Use one PWM signal and send to both E and F. Requires only one PWM signal however there is significant power loss and shorter motor RPM range)

PIN H	PIN G	PINS E + F	Motor Output
5 volts	0 volts	PWM (500 Hz, 5V amplitude)	Variable speed Forward
0 volts	5 volts	PWM (500 Hz, 5V amplitude)	Variable speed Reverse

*At 12V input, motor operates between roughly 55% to 95% duty cycle, 65% to 95% duty cycle under significant load

Troubleshooting

Motor not turning at low speeds or low Duty Cycle

If you are currently controlling the motor using Method 3 above, try using Method 2. Method 2 allows for a lower Duty Cycle before the motor cuts off. If using Method 2 is not possible, try decreasing the voltage supplied to the board so the motor receives a lower voltage at a higher duty cycle.

Motor not receiving power

For the motor to receive any power from the motor driver, both the Forward and Reverse Enable pins (pins E and F) must be high (>2V) regardless of whether the motor will spin forward or reverse. If both are high and the motor is still not receiving power, check to make sure +5V is being supplied externally to pin B to power the motor driver board.